IN THE CLAIMS:

Please AMEND claims 8, 10 and 11, and ADD new claims 12-23, as follows. For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

1. (Previously Presented) An illumination system for illuminating a surface by use of light from a light source, said illumination system comprising:

an emission angle conserving optical unit having a lens array, for receiving light from the light source; and

a diffractive optical element for diffracting light to produce a desired light intensity distribution on a predetermined plane,

wherein said diffractive optical element is disposed at or adjacent to a position which is optically conjugate with a light exit surface of said emission angle conserving optical unit.

2. (Original) An illumination system according to Claim 1, further comprising a multiple-beam producing element and a light projecting element for superposing light beams from said multiple-beam producing element one upon another on the surface to be illuminated, wherein the predetermined plane corresponds to a light entrance surface of said multiple-beam producing element.

3. (Original) An illumination system according to Claim 2, further comprising a zoom optical system for projecting the light intensity distribution, produced by said diffractive optical element, upon the light entrance surface of said multiple-beam producing element at a predetermined magnification.

4. (Original) An illumination system according to Claim 3, wherein there are a plurality of emission angle conserving optical units of different divergent angles, and wherein said emission angle conserving optical units are interchangeably set at a light path in accordance with a change in magnification of said zoom optical system.

5. (Original) An illumination system according to Claim 4, wherein an emission angle conserving optical unit placed at the light path is changed by another, whereby a numerical aperture of light incident on the light entrance surface of said multiple-beam producing element is substantially registered with a preset numerical aperture of said multiple-beam producing means.

6. (Original) An illumination system according to Claim 1, wherein there are a plurality of diffractive optical elements for producing different light intensity distributions on the predetermined plane, wherein said diffractive optical elements are interchangeably set at a light path to produce a desired light intensity distribution on the predetermined plane.

7. (Previously Presented) An illumination system according to Claim 1, wherein said diffractive optical element is one of a phase type and an amplitude type computer hologram.

8. (Currently Amended) An illumination system according to Claim 1, wherein said ~~emission angle conserving optical unit comprises~~ said lens array is a fly's eye lens having small lenses arrayed two-dimensionally.

9. (Cancelled)

10. (Currently Amended) An exposure apparatus, comprising:

an illumination ~~optical~~ system for illuminating a mask ~~surface, as a surface to be illuminated,~~ with use of light from a light source, said illumination ~~optical~~ system including (i) an emission angle conserving optical unit having a lens and an aperture or a lens array, for receiving light from the light source, and (ii) a diffractive optical element for diffracting light from said emission angle conserving optical unit to produce a desired light intensity distribution on a predetermined plane, wherein said diffractive optical element is disposed at or adjacent to a position which is optically conjugate with a light exit surface of said emission angle conserving optical unit; and

a projection optical system for projecting a pattern ~~formed on~~ of the mask ~~surface, as illuminated with light from said illumination optical system,~~ onto a wafer.

11. (Currently Amended) A device manufacturing method, comprising the steps of:

applying a photosensitive material to a wafer;

illuminating a mask ~~surface, as a surface to be illuminated,~~ with use of light from an illumination ~~optical~~ system, wherein the illumination ~~optical~~ system includes (i) an emission angle conserving optical unit having a lens and an aperture or a lens array, for receiving light from the light source, and (ii) a diffractive optical element for diffracting light from the emission angle conserving optical unit to produce a desired light intensity distribution on a predetermined plane, and wherein the diffractive optical element is disposed at or adjacent to a position which is optically conjugate with a light exit surface of said emission angle conserving optical unit;

projecting, through a projection optical system, a pattern ~~formed on~~ of the mask ~~surface~~ onto [[a]] the wafer; and

developing the ~~transferred pattern~~ wafer.

12. (New) An illumination system for illuminating a surface by use of light from a light source, said illumination system comprising:

a lens array, for receiving light from the light source; and

a diffractive optical element for diffracting light to produce a desired light intensity distribution on a predetermined plane,

wherein said diffractive optical element is disposed adjacent to a position where the light from said lens array is focused by said lens array.

13. (New) An illumination system according to Claim 12, further comprising a multiple-beam producing element and a light projecting element for superposing light beams from said multiple-beam producing element one upon another on the surface to be illuminated, wherein the predetermined plane corresponds to a light entrance surface of said multiple-beam producing element.

14. (New) An illumination system according to Claim 13, further comprising a zoom optical system for projecting the light intensity distribution, produced by said diffractive optical element, upon the light entrance surface of said multiple-beam producing element at a predetermined magnification.

15. (New) An illumination system according to Claim 14, wherein there are a plurality of emission angle conserving optical units of different divergent angles, and wherein said emission angle conserving optical units are interchangeably set at a light path in accordance with a change in magnification of said zoom optical system.

16. (New) An illumination system according to Claim 15, wherein an emission angle conserving optical unit placed at the light path is changed by another whereby a numerical aperture of light incident on the light entrance surface of said multiple-beam producing element is substantially registered with a preset numerical aperture of said multiple-beam producing means.

17. (New) An illumination system according to Claim 12, wherein there are a plurality of diffractive optical elements for producing different light intensity distributions on the predetermined plane, wherein said diffractive optical elements are interchangeably set at a light path to produce a desired light intensity distribution on the predetermined plane.

18. (New) An illumination system according to Claim 12, wherein said diffractive optical element is one of a phase type and an amplitude type computer hologram.

19. (New) An illumination system according to Claim 12, wherein said lens array is a fly's eye lens having small lenses arrayed two-dimensionally.

20. (New) An exposure apparatus comprising:

an illumination system for illumination a mask with use of light from a light source, said illumination system including (i) a lens array, for receiving light from the light source, and (ii) a diffractive optical element for diffracting light to produce a desired light intensity distribution on a predetermined plane, wherein said diffractive optical element is disposed adjacent to a position where the light from said lens array is focused by said lens array; and

a projection optical system for projecting a pattern of the mask onto a wafer.

21. (New) An exposure apparatus comprising:

an illumination system for illuminating a mask with use of light from a light source, said illumination system including (i) a lens and aperture, for receiving light from the light source, and (ii) a diffractive optical element for diffracting light to produce a desired light intensity distribution on a predetermined plane, wherein said diffractive optical element is disposed adjacent to a position where the light from said lens is focused by said lens; and

a projection optical system for projecting a pattern of the mask onto a wafer.

22. (New) A device manufacturing method, comprising the steps of:

applying a photosensitive material to a wafer;

illuminating a mask with use of light from an illumination system, wherein the illumination system includes (i) a lens array, for receiving light from a light source, and (ii) a diffractive optical element for diffracting light to produce a desired light intensity distribution on a predetermined plane, wherein the diffractive optical element is disposed adjacent to a position where the light from the lens array is focused by the lens array;

projecting, through a projection optical system, a pattern of the mask onto [[a]] the wafer; and

developing the wafer.

23. (New) A device manufacturing method comprising the steps of:

applying a photosensitive material to a wafer;

illuminating a mask with use of light from an illumination system, wherein the illumination system includes (i) a lens and aperture, for receiving light from a light source, and (ii) a diffractive optical element for diffracting light to produce a desired light intensity distribution on a predetermined plane, wherein the diffractive optical element is disposed adjacent to a position where the light from the lens is focused by the lens;

projecting, through a projection optical system, a pattern of the mask onto [[a]] the wafer; and

developing the wafer.